IN THE CLAIMS:

1. (Currently amended) Apparatus configured to guide a guide wire through body tissue, said apparatus comprising a guide wire having a first proximal end and second distal end with at least one interferometric guidance system coupled thereto, said guide wire distal end comprising at least one stationary fiber of said interferometric guidance system, said interferometric guidance system configured for generating interference information from [the] body tissue, wherein said interferometric system [comprising] comprises a circuit for generating Doppler shift information configured to detect neovascular flow through the tissue by revealing relative changes in blood flow velocity at the guide wire distal end.

2. (Original) Guide wire guiding apparatus in accordance with Claim 1 wherein said interferometric system comprises:

a low coherence illumination source for generating a first light beam;

a beam splitter for splitting the first light beam into a second light beam and a third light beam;

a first optic fiber having a first end and a second end;

a second optic fiber having a first end and a second end, said first optic fiber wrapped around a first piezo electric transducer, said second optic fiber wrapped around a second piezo electric transducer, said first optic fiber coupled to the guide wire so that said second end of said first optic fiber is adjacent said second end of said guide wire;

a fixed reflector on said second optic fiber second end;

a detecting element communicatively coupled to said first ends of said first and second optic fibers, said detecting element configured to determine interference between a light beam reflected through said first optic fiber and a light beam reflected through said second optic fiber.

3. (Original) Guide wire guiding apparatus in accordance with Claim 2 wherein said low coherence illumination source comprises a laser.

4. (Original) Guide wire guiding apparatus in accordance with Claim 2 wherein said low coherence illumination source comprises a superluminescent emitting diode.

5. (Original) Guide wire guiding apparatus in accordance with Claim 2 wherein said circuit for detecting a Doppler shift comprises:

a broad band filter; and

a frequency-to-voltage converter coupled in series to said broad band filter, wherein said broad band filter is coupled to an output of said detecting element.

6. (Original) Guide wire guiding apparatus in accordance with Claim 5, said circuit for detecting a Doppler shift further comprising an FM detector, said FM detector coupled in series to an output of said broad band filter, and to an input of said frequency-to-voltage converter.

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7. (Original) Guide wire guiding apparatus in accordance with Claim 1 wherein said first optic fiber second end is polished flat.

8. (Original) Guide wire guiding apparatus in accordance with Claim 1 wherein said first optic fiber second end is polished at an angle of about 8 degrees relative to a cross-sectional plane orthonormal to a long axis of said first optic fiber.

9. (Original) Guide wire guiding apparatus in accordance with Claim 1 wherein said second optic fiber second end is polished flat.

10. (Original) Guide wire guiding apparatus in accordance with Claim 1 wherein said second optic fiber second end is polished at an angle of about 8 degrees relative to a cross-sectional plane orthonormal to a long axis of said first optic fiber.

11. (Original) Guide wire guiding apparatus in accordance with Claim 1 further comprising a visual graphic display coupled to said interferometric system, said visual

graphic display configured to display the interferometric information and the Doppler shift information.

12. (Currently amended) Apparatus for detecting neovascular flow through an obstruction in a blood vessel, said apparatus comprising a guide wire having a first proximal end and second distal end with at least one interferometric guidance system coupled thereto [a] the guide wire, said guide wire distal end comprises at least one stationary optical fiber of said interferometric guidance system, an interferometric apparatus,

a broad band filter coupled to an output [of an] of said interferometric apparatus, said interferometric apparatus generating interferometric peaks of varying frequencies; and

a frequency-to-voltage converter coupled in series to said broad band filter.

13. (Original) Apparatus in accordance with Claim 12 further comprising an FM detector coupled to an output of said broad band filter and providing an input to said frequency-to-voltage converter.

14. (Currently amended) A method to determine neovascular flow through tissue in a vessel, said method comprising using an apparatus configured to guide a guide wire through body tissue, said apparatus comprising a guide wire having a first proximal end and second distal end with at least one interferometric guidance system coupled thereto, said guide wire distal end comprising at least one stationary optical fiber of said interferometric guidance system, said interferometric system configured to examine the vessel and [comprising performing] to perform a Doppler shift analysis on frequencies of interference peaks generated by the interferometric system examining the vessel to determine the velocity of blood.

15. (Original) A method in accordance with Claim 14 wherein performing the Doppler shift analysis includes the steps of:

applying a known amplitude-modulated voltage signal to a first PZT and a second PZT to produce a first known component of a Doppler frequency shift in the frequencies of interference peaks;

measuring an actual Doppler frequency shift in the interference peaks;

subtracting the first known component of the Doppler frequency shift from the actual Doppler frequency shift to determine a second component of the actual Doppler frequency shift, wherein the second component reveals the presence of neovascular channels in the vessel.

16. (Original) A method in accordance with Claim 15 wherein subtracting the first known component from the actual Doppler frequency shift to determine a second known component comprises the step of determining whether the second component has an increase in magnitude.

17. (Original) A method in accordance with Claim 14 wherein said method comprises generating a Doppler shift analysis comprising comparing actual shift to predicted shift of the path length change velocity whereby the velocity path component is constant and the observed variance is from a velocity change of the sample component.

18. (Original) A method in accordance with Claim 14 wherein the neovascular flow is determined by linear changes in the path length of a signal generated by the interferometric system.